

GP-303377

**RECEIVED  
CENTRAL FAX CENTER  
DEC 13 2006****REMARKS**

Claims 1-12, 14 and 15 are pending in the present Application. Claims 1, 10 and 15 have been amended, claims 9 and 14 has been canceled and no claims have been added, leaving Claims 1- 8, 10-12 and 15 for consideration upon entry of the present Amendment.

Claims 1 and 10 have been amended to recite an insulator disposed proximate to the outlet opening, wherein the insulator is heat resistant to 1100 C. Claim 10 has been further amended to recite the reaction surface downstream from the insulator. Claim 15 is currently amended to recite at least one vaporizer upstream from the inlet device. Support for the amendments is found throughout the specification, at least at [0028], [0030] and [0032], and in originally filed claims 9 and 14 and Figure 3. No new matter has been introduced by these amendments. It is believed that the amendments made herein may be properly entered at this time, i.e., after final rejection, because the amendments do not require a new search or raise new issues and reduce issues for appeal.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

**Claim Rejections Under 35 U.S.C. § 102(b)**

Claims 1-6 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Patent No. 5,147,201 to Xiong (hereinafter "Xiong") in view of U.S. Application Publication No. 2002/0150800 A1 to Asou et al. (hereinafter "Asou".) Applicants respectfully traverse this rejection.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Variant Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

Xiong fails to anticipate Applicants' claimed inlet device for a reactor because there is no disclosure of an insulator disposed proximate to the outlet opening, wherein

GP-303377

the insulator is heat resistant to 1100°C. Applicants have carefully studied and can find no such disclosure of an insulator.

With regard to the Asou reference, it is believed to be improper given that the present rejection is based on anticipation. The Office Action failed to provide any insight as to why the Xiong reference was in view of the Asou reference.

In view of the foregoing, the rejection is requested to be withdrawn.

Claim Rejections Under 35 U.S.C. § 103(a)

A. Claim 10 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent Application Publication No. 2002/0150800 A1 to Asou et al. (hereinafter "Asou") in view of U.S. Patent No. 5,147,201 to Xiong (hereinafter "Xiong"). Applicants respectfully traverse the rejection.

Asou is generally directed to a hydrogen-generator. In practice, the hydrogen generator disclosed in Asou comprises a burner arranged in the vicinity of a reforming unit for heating the reformer. A raw material supply and water supply are provided in fluid communication with the reformer. Apart from this generic disclosure, there are no details as to an inlet device for providing the water and raw materials to the reformer. The burner disclosed in Asou is in thermal communication with the reformer such that the exhaust gas in the burner is discharged from an outlet on the reforming unit.

Xiong is generally directed to a radiant gas burner. The gas burner includes a porous matrix bed and has a shape such that the cross-sectional area diverges along an increasing radius of the porous matrix bed. It is important to note that Xiong teaches and suggests that complete combustion of the fuel/air mixture occur within the porous media of the gas burner.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally

GP-303377

available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Applicants contend that the Examiner has not established a *prima facie* case of obviousness. The cited references, individually or in combination, fail to teach Applicants' claimed fuel reforming system. More specifically, the cited references fail to teach or suggest, *inter alia*, the featured inlet device and insulator.

In Asou, there is no detailed disclosure of any inlet device for the reformer. Although the Office Action correctly indicates that Asou discloses a burner outlet in fluid communication with a reactor/reformer, there are no details as to the inlet device or the presence of an insulator intermediate the inlet outlet and the reactor. The only teaching is that raw materials and water are fed directly to the reformer and a burner is employed to heat the reformer during use to provide a high yield of hydrogen.

Xiong fails to compensate for these deficiencies. Xiong is directed to a gas burner. Because of this, combustion occurs within the porous media of the gas burner, which happens to have a frustoconical shaped interior region as is common for many gas burners. There is no disclosure of an inlet device to a reactor as claimed nor is there any disclosure of an insulator. In fact, because a flame is generated within the porous media, one of skill in the art would not be motivated to provide an insulator intermediate the inlet device and a reactor. The presence of an insulator in Xiong would defeat the intended purpose of its function as a gas burner. Flames and/or heat would not be effectively discharged from Xiong's gas burner if an insulator were disposed at about the outlet opening of the gas burner. In this regard, the courts have held that "[i]f the proposed modification would render the prior art invention being modified

GP-303377

unsatisfactorily for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon* 733 F. 2d 900, 221 USPQ 1125 (Fed. Cir. 1984). The courts have also held that "[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious." *In re Ratti* 270 F. 2d 810, 123 USPQ 349 (CCPA 1959). Such is the case, here. The proposed modification would defeat the intended purpose.

Applicants further maintain that the Office Action has used an improper standard in arriving at the rejection of the above claims under section 103, based on improper hindsight, which fails to consider the totality of applicant's invention and to the totality of the cited references. More specifically, the Office Action has used Applicant's disclosure to select portions of the cited references to allegedly arrive at Applicant's invention. In doing so, the Office Action has failed to consider the teachings of the references or Applicant's invention as a whole in contravention of section 103.

Even if one of skill in the art were so inclined to replace the burner of Xiong with that of Asou's as suggested in the Office Action, the resulting combination would still be deficient and fail to teach or suggest Applicants claimed fuel reforming system. As taught by Asou, the burner is employed to regulate the heat of the reformer to optimize the reactions occurring therein so as to maximize efficiency. The resulting combination still fails to teach or suggest any inlet device for providing a homogenous mixture of reactants. In Asou, the only disclosure is that water and raw materials are provided in fluid communication with the reactor/reformer. There is no disclosure or suggestion to provide a homogenous mixture prior to entering the reactor/reformer. Still further, there is no teaching or suggestion of an insulator. As noted in Applicants' specification in paragraph [0032], the insulator may protect the bottom surface of the housing from exposure to high temperatures, such as about 800° C and higher, and possible oxidation of the second retention member disposed at the outlet during processing. The higher temperatures are generated upon contact of the homogenous mixture of reactants with the

GP-303377

reformer catalyst, which is downstream from the inlet device and insulator. This is markedly different from what is taught and suggested by the combination of references.

In view of the foregoing, Applicants respectfully request removal of the rejection and allowance of Claim 10.

B. Claims 7-8 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Xiong in view of U.S. Application Publication No. 2004/0120847 A1 to Dijkhuizen (hereinafter "Dijkhuizen.") Applicants respectfully traverse the rejection.

Xiong is discussed above.

Dijkhuizen is generally directed to methods of decreasing corrosivity of a water-containing crude oil mixture, e.g., in a pipeline system or oil tanker.

Dijkhuizen fails to compensate for the deficiencies in Xiong. For reasons similar to that discussed above, the cited references, individually or in combination, fail to teach or suggest an inlet device for a reactor as claimed by Applicants. Xiong is directed to a gas burner that includes porous media disposed within a frustoconical interior region. Combustion occurs within the porous media. As such, one of skill in the art would not place an insulator proximate to the outlet opening as claimed. For reasons discussed above, an insulator positioned in such a manner would destroy the intended purpose of Xiong, e.g., its function as a gas burner.

Accordingly, the rejection is requested to be withdrawn.

C. Claims 11-12 are rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Asou in view of Xiong and further in view of Dijkhuizen. Applicants respectfully traverse the rejection.

Asou, Xiong, Dijkhuizen are discussed above. For reasons discussed above, the cited references fail to teach a fuel reforming system comprising, *inter alia*, an inlet device as claimed, a insulator disposed proximate to the outlet opening, or a reaction

GP-303377

surface downstream from the insulator. Therefore, Applicants respectfully request removal of the rejection and allowance of Claims 11-12.

D. Claims 9 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Xiong and further in view of U.S. Application Publication No. 2003/0159354 A1 to Edlund et al. (hereinafter "Edlund"). Applicants respectfully traverse the rejection.

The rejection of claim 9 is rendered moot by the cancellation thereof.

E. Claims 14-15 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Asou et al. in view of Xiong and further in view of Edlund. Applicants respectfully traverse the rejection.

Asou and Xiong, are discussed above. For reasons discussed above, the cited references fail to teach a fuel reforming system comprising, *inter alia*, an inlet device as claimed, a insulator disposed proximate to the outlet opening, or a reaction surface downstream from the insulator.

Edlund fails to compensate for the above noted deficiencies of Asou and Xuiong. Edlund is generally directed to a fuel processing system. The only reference to an insulator is to insulation placed around the exterior of the shell [of the fuel processor] and end plates located at the product outlet ports of the fuel reformer. This is markedly different an insulator disposed proximate to an outlet of an inlet device. Nothing in Edlund teaches or suggests the inlet device as claimed.

For reasons similar to that discussed above, the cited references, individually or in combination, fail to teach or suggest an inlet device for a reactor as claimed by Applicants. Therefore, Applicants respectfully request removal of the rejection and allowance of Claims 15.

The rejection against claim 14 is rendered moot by the cancellation thereof.

GP-303377

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

CANTOR COLBURN LLP

By Cathy Roumell  
Cathy Roumell  
Registration No. 47,909

Date: December 13, 2006  
CANTOR COLBURN LLP  
Telephone (248) 524-2300  
Facsimile (248) 524-2700